

NEW DISTRIBUTION RECORDS FOR EUPATORIEAE (ASTERACEAE) IN THE UNITED STATES

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ABSTRACT

Several species of Eupatorieae occur in southern Arizona and New Mexico at the northern end of their otherwise Mexican distribution: *Stevia salicifolia* (reported from New Mexico by a single collection, the exact locality unknown and perhaps in immediately adjacent Mexico), *Ageratina (Eupatorium) thyrsoflora* (known from Arizona by a single collection), and *Koanophyllon (Eupatorium) palmeri* (previously confused with *K. solidaginifolium*). Reports of *K. palmeri* or *K. solidaginifolium* from New Mexico have not been confirmed. *Chromolaena (Eupatorium) bigelovii*, primarily a species of northeastern Mexico, is documented for the U.S.A. by three Texas collections—its occurrence was recorded in Arizona (cited from only the type collection), but that record apparently reflects a confusion of label data for the type, which almost certainly was collected along the Texas-Mexico border. Lectotypes are chosen for *Eupatorium arborescens*, *Koanophyllon (Eupatorium) palmeri* (var. *palmeri*), and *Ageratina (Kyrstenia) thyrsoflora*.

RESUMEN

Varias especies de Eupatorieae viven en el sur de Arizona y Nuevo México en el extremo norte de su distribución que de otro modo sería únicamente mexicana: *Stevia salicifolia* (citada de Nuevo México con una sola recolección, cuya exacta localidad es desconocida y quizás adyacente a México), *Ageratina (Eupatorium) thyrsoflora* (conocida de Arizona con una sola recolección), y *Koanophyllon (Eupatorium) palmeri* (previamente confundida con *K. solidaginifolium*). Las citas de *K. palmeri* o *K. solidaginifolium* de Nuevo México no han sido confirmadas. *Chromolaena (Eupatorium) bigelovii*, primariamente una especie del noreste de México, se documenta para los Estados Unidos mediante tres colecciones de Texas—su ocurrencia fue citada en Arizona (únicamente don la colección del tipo), pero esa cita refleja aparentemente una confusión de los datos de la etiqueta del tipo, que casi con seguridad fue colectado a lo largo de la frontera de Texas y México. Se eligen lectotipos de *Eupatorium arborescens*, *Koanophyllon (Eupatorium) palmeri* (var. *palmeri*), y *Ageratina (Kyrstenia) thyrsoflora*.

Preparation of Eupatorieae treatments for Mexico and the Flora of North America (FNA) region has brought to light three species previously unreported for the United States. Both are primarily distributed in western Mexico and are newly recognized as occurring in Arizona and New Mexico. A third primarily Mexican species is rare in Texas; it previously has been recorded as a member of the Arizona flora but, as discussed here, it does not occur in that state. Morphological descriptions of all four species are provided in the FNA treatments.

1. *Stevia salicifolia*

This species apparently has not been included for the U.S.A. in any published floristic account, but it was recorded in a dissertation study (Grashoff 1972) from southwestern New Mexico by a single collection of E.A. Mearns, naturalist for the United States and Mexican Boundary Survey of 1892–1894. Grashoff cited the collection as from Grant County, but the San Luis Mountains are a range primarily of northern Sonora and Chihuahua, Mexico, with an extension into Hidalgo County.

Voucher specimen: U.S.A. **New Mexico. [Hidalgo Co.]**: cañon east side of San Luis Mts., 11 Sep 1893, *Mearns* 2220 (US).

In further refinement of the San Luis Mountains locality, Hubbard (1999) concluded that *Penstemon campanulatus*, which had been considered to be represented in the U.S.A. flora only by a Mearns collection, was collected on the Mexican side of the border rather than in New Mexico (cañon, east side San Luis Mts., 11 Sep 1893, *Mearns* 2222 - US). In view of this, the U.S.A. record documented here for *Stevia salicifolia* should be considered doubtful, even though it seems likely that the species has stepped across the border in one place or another.

Geographic-ecological summary.—Flowering (Jul-)Aug-Oct (in northern Mexico). Oak and oak-pine woodland, rocky sites, crevices, boulder pockets; ca. 1500–2650 m (data from northern Mexico). New Mexico; Mexico (Michoacan, Edo. Mexico, Puebla, and Veracruz northward to Sonora, Chihuahua, Coahuila, Nuevo León, Durango, Zacatecas, San Luis Potosí). The range of var. *salicifolia* also closely approaches Texas and Arizona (see map in Turner 1997).

Stevia salicifolia is a variable species—many infraspecific taxa have been named but most were regarded by Grashoff as synonyms of var. *salicifolia*. Among the U.S.A. species of *Stevia*, *S. salicifolia* is distinct in its glabrous and shiny stem and leaf surfaces, which results from the viscid exudate of sunken glands; stems and leaves of the other U.S.A. species usually are sparsely pubescent and not shiny.

Stevia salicifolia Cav., *l.c.* 4: 32. pl. 354. 1797. “The TYPE ... came from plants cultivated at the Royal Botanical Garden, Madrid; Ortega states that the seed was sent from Mexico by Sesse.” (McVaugh 1984, p. 895).

2. *Ageratina thyrsoflora*

This species is native primarily to the states of Sonora, Chihuahua, Sinaloa, Durango, and Jalisco in western Mexico (McVaugh 1984; Turner 1997). It is known from the United States only by a single collection near the international border.

U.S.A. **Arizona.** [**Santa Cruz Co.**]: near Nogales, 15 Sep 1929, *Harrison & Kearney* 6039 (ARIZ fide Phil Jenkins, LL).

Geographic-ecological summary.—Flowering Sep–Nov. Rocky sites, oak woodland; 1000–2200 m (data from Mexican collections at TEX-LL and published notes of McVaugh 1984). Arizona; Mexico (Sonora, Chihuahua, Sinaloa, Durango, Jalisco).

Ageratina thyrsoflora is recognized by its strict, unbranched or few-branched stems with alternate, densely arranged leaves, small heads densely clustered in a single, terminal aggregate, prominently orange-veined corollas and phyllaries, and close cauline and petiolar puberulence of minute, sharply upwardly bent hairs. Morphology is relatively uniform over the geographic range, except in two collections from Sonora (*Muller* 3655, LL) and Chihuahua (*Gentry et al.* 18026, ARIZ, LL), where stipitate glands are mixed with the eglandular puberulence on lower stems and petioles. One collection from Jalisco (*McVaugh* 21771, LL) also shows a tendency to produce stipitate glands.

Ageratina thyrsoflora (E. Greene) R. King & H. Robinson, *Phytologia* 19:227. 1970. *Kyrstenia thyrsoflora* E. Greene, *Leafl. Bot. Observ. Crit.* 1:9. 1903. *Eupatorium thyrsoflorum* (E. Greene) B.L. Robinson, *Proc. Amer. Acad. Arts* 43:36. 1907. TYPE: MEXICO. CHIHUAHUA: Southwestern Chihuahua, Aug 1885, *E. Palmer* 275 (LECTOTYPE selected here: US, internet image!). In the protologue, Greene cited the following: “Chihuahua, Mexico, chiefly southward in the State; collected by Palmer, Pringle, and E.A. Goldman, and always distributed for *E. occidentale* var. *Arizonicum* ...” A collection at GH was cited by McVaugh (1984) as “isotype” of *K. thyrsoflora* (near Chihuahua, 1 Oct 1885, *C.G. Pringle* 613), but there is no duplicate of this at NDG (fide Barbara Hellenthal) or at US. Greene perhaps studied the Palmer specimen at US before his time at the Smithsonian as an associate in botany (in 1904–1909); he did not annotate the Palmer sheet, however, even though he did make handwritten notations on US type sheets of *Kyrstenia calophylla*, *K. laeta*, *K. parvifolia*, and *K. rufa* (fide Barbara Hellenthal, pers. comm).

Eupatorium thyrsoflorum var. *holoclerum* B.L. Robinson, Proc. Amer. Acad. Arts 43:36. 1907.

TYPE: MEXICO. DURANGO: City of Durango and vicinity, Apr–Nov 1896, *E. Palmer* 755 (HOLOTYPE: GH; ISOTYPES: MO!, US internet image!).

3. *Koanophyllon palmeri*

Koanophyllon (*Eupatorium*) *palmeri* is native primarily to western Mexico (McVaugh 1984; Turner 1997) and is known from the U.S.A. by collections from south-central Arizona. A similar taxon (*Eupatorium palmeri* var. *tonsum* B.L. Robinson) occurs in near-coastal localities from Michoacan to Colima, Jalisco, Nayarit, and Sinaloa. The Arizona plants are var. *palmeri* (which occurs southward through Sinaloa, Chihuahua, and Sonora to Durango and Jalisco). *Eupatorium arborescens* (as cited below) from Chihuahua is a synonym of *K. palmeri* var. *palmeri*.

Vouchers for records of *Koanophyllon palmeri* in southwestern New Mexico (Hidalgo and Grant counties—as mapped by Martin and Hutchins 1980) have not been located in New Mexico herbaria (J. Mygatt, UNM, pers. comm. and R. Spellenberg, NMC, pers. comm.). The basis for the Hidalgo County record may be a citation by Wootton and Standley (1915, p. 647) of a Charles Wright collection (“Guadalupe Pass, *Wright 1146*,” [4–5 October, 1851]). According to Wootton and Standley (1915, p. 647), “Guadalupe Pass is on the southern boundary of the State, and Wright’s specimens may have come from either Mexico or New Mexico.” It seems reasonable to maintain *K. palmeri* as a member of the New Mexico flora, at least tentatively, especially in view of the map points shown by Martin and Hutchins (1980).

U.S.A. Arizona. Cochise Co.: Guadalupe Mts., Guadalupe Canyon, 13 Oct 1946, *Darrow et al.* 3562 (LL). **Pima Co.:** W side of Mt. Baboquivari, 6 Oct 1944, *Gould et al.* 2670 (LL); Baboquivari Mts., 25 Sep, 1927, *Harrison* 4754 (LL); Baboquivari Mts., Sep 1931, *Hutchinson* 6932 (LL); Sta. Catalina Mts., Sabino Canyon, 27 Sep 1934, *Kearney & Peebles* 10257 (LL); Baboquivari Mts., 30 Sep 1934, *Kearney & Peebles* 10373 (LL); Baboquivari Canyon, 11 Oct 1925, *Peebles et al.* 413 (LL); Tucson Mts., Hugh Norris Trail, 7 Nov 1976, *Urry* 840 (TEX); Waterman Mountains, NE end of road to Silver Hill Mine, 5 Dec 2001, *Van Devender* 2001-1014 (TEX). **Santa Cruz Co.:** Coronado Natl. Forest, just to the E end of Forest Rd 217, near the Dos Amigos Mine, E of Old Glory Canyon and Warsaw Canyon, 31 Aug 2001, *Goldman* 2108 (BRIT); Peck Canyon, Atascosa Ranch, 18 Nov 1981, *Van Devender* s.n. (TEX); Holden Canyon, 1 mi NW of Bartlett Mts., 29 Oct 1981, *Van Devender & Toolin* s.n. (TEX).

Geographic-ecological summary.—Flowering Sep–Nov(–Dec). Shaded rocks along streams, crevices, often in oak woodland; 850–1500 m. (data from Arizona collections).

Koanophyllon palmeri (A. Gray) R. King & H. Robinson, Phytologia 22:150. 1971. *Eupatorium palmeri* A. Gray, Proc. Amer. Acad. Arts 21: 383. 1886. Gray did not cite a specific collection but noted “type locality, ‘shady places high up in mountains above Batopilas.’” TYPE: MEXICO. [CHIHUAHUA]: Southwestern Chihuahua, August to November 1885, *Palmer* 144 (LECTOTYPE designated here: GH!; ISOLECTOTYPE: US internet image!). Another collection, *E. Palmer* 263 (GH!), is similarly labeled. Both GH sheets were annotated by Gray as “*Eupatorium palmeri* n. sp.” McVaugh’s account (1956) of Palmer’s itinerary indicates that collections in the vicinity of Batopilas were made in August through early October 1885.

Eupatorium arborescens M.E. Jones, Contr. West. Bot. 12:43. 1908. TYPE: MEXICO. CHIHUAHUA: Sierra Madre Mts., Guayanopa Canon, 3600 feet alt., in the Tropical Life Zone, 24 Sep 1903, *M.E. Jones* s.n. (LECTOTYPE designated here: RSA-POM 41799, photocopy!; ISOLECTOTYPE: RSA-POM 41800, photocopy!). The two sheets exactly match the protologue in label data and probably are duplicates of the same collection; 41799 bears a single branch; 41800 has two branches. Each sheet is labeled in the same handwriting (apparently that of Phillip Munz, fide Michael Denslow at RSA-POM) “Part of type, *Eupatorium arborescens* Jones.” Leaf position, vestiture and involucre features are those of *K. palmeri*, although the acuminate leaf apices are more similar to those of *K. solidaginifolium*.

Plants of *Koanophyllon palmeri* in Arizona have been previously identified as *K. solidaginifolium* (A. Gray) King & H. Robinson (= *Eupatorium solidaginifolium* A. Gray,

see citation below). As interpreted here, however, and in Turner (1997) and Blake (1924), *K. solidaginifolium* occurs in north-central Mexico (eastern Chihuahua, Coahuila, north-eastern Durango, northern Zacatecas) and into the trans-Pecos area of Texas, east of the range of *K. palmeri*. Their ranges approach each other in central Chihuahua, but the two apparently are allopatric. The following contrast separates the two species in the U.S.A. and northwestern Mexico.

Leaves all opposite, blades apically acute, upper surfaces sparsely strigose to weakly hispidulous; involucre (3–)3.5–4 mm long; phyllaries herbaceous to the margins, at least the outer puberulent, all usually weakly ciliate, outermost ovate-elliptic to obovate _____ **Koanophyllon palmeri**
 Leaves usually subopposite to alternate on distal third of stem, blades apically long-acuminate, upper surfaces glabrous; involucre 4.5–5.5 mm long; phyllaries with narrow but distinct hyaline-translucent margins, glabrous and eciliate, outermost narrowly lanceolate. _____ **Koanophyllon solidaginifolium**

Eupatorium solidaginifolium A. Gray, Smithsonian Contr. Knowl. 3(5) [Plant. Wright. 1]: 87. 1852. TYPE: "Collected in Expedition from Western Texas to El Paso, New Mexico, May–October, 1849, by Charles Wright" [as on label], Wright 256 (HOLOTYPE: GH, photocopy!; ISOTYPE: GH, photocopy!). Gray's citation in the protologue was "Mountains between the Limpia and the Rio Grande, New Mexico." According to I.M. Johnston's commentary on Wright's field notes (fide Walter Kittredge, GH), this locality matches Wright's field number of '256,' as recorded on the type labels. Limpia Creek and Limpia Canyon are in present-day Jeff Davis Co., Texas, and it is probable that Wright's collection was made there (recent collections document the species in Jeff Davis Co. and Presidio Co.), probably in late August (as inferred from Wootton 1906). The specimens were annotated as 'holotype' and 'isotype' by D.E. Boufford in 1981.

4. *Chromolaena bigelovii*

Chromolaena bigelovii has been included in various summaries of the Arizona flora (e.g., Kearney & Peebles 1951; Lehr 1978) on the basis of the protologue, which cited "On the Gila, Sonora; Parry." Kearney and Peebles (1951, p. 845) observed that the species is "apparently known in Arizona only from the type collection on the Gila River (Bigelow)," and the present authors have located no further records of the species from Arizona. In contrast, plants matching the type of *C. bigelovii* (below) have been collected at numerous localities in northeastern Mexico (Coahuila, Nuevo León, San Luis Potosí—Turner 1997) and at two sites in Texas (mapped in Turner et al. 2003; documented here). *Eupatorium madreense* (as cited below) from Nuevo León is a synonym of *Eupatorium bigelovii*.

U.S.A. Texas. Brewster Co.: Big Bend National Park, Basin of Chisos Mt., base of Baldy Peak, 6 Sep 1950, Warnock 9587 (SRSC); Big Bend National Park, Sierra Quemada, Claro 2 Spring, 29 Oct 2000, Bartel 211 (SRSC). **Uvalde Co.:** on chalk bluffs at Park Chalk Bluff along the Nueces River, ca. 15 mi NW of Uvalde, 12 Dec 1967, Correll 35433 (LL).

Geographic-ecological summary.—Flowering Oct–Dec. Dry limestone hills in oak woodlands, talus; ca. 1000–1800 m. (data primarily from Texas, Coahuila, and Nuevo León).

Chromolaena bigelovii (A. Gray) R. King & H. Robinson, Phytologia 20:208. 1970. *Eupatorium bigelovii* A. Gray in Torrey, Rep. U.S. & Mex. Bound. Survey, Bot. 75. 1859. TYPE: U.S.A. [locality uncertain but probably along the Texas-Coahuila boundary, 1848–1855], J.M. Bigelow 12 (probable HOLOTYPE: GH, photocopy!). The protologue by Gray cited "On the Gila, Sonora; Parry." Blake (1924) and Kearney and Peebles (1951) noted that the locality should be placed in Arizona than Mexico. Specimen labels, however, on a collection that is reasonably interpreted as the type are annotated in Gray's handwriting as "E. bigelovii n. sp." and "E. bigelovii Gray" and do not have locality information. On the original label, "Mex. Bound. Survey No. 12," a note by Gray says "Bigelow—locality not recorded"; another note (B.L. Robinson's handwriting) reads that "Identical material in Paris Herb. and Berlin Herb. bears Mex. Bound. Surv. label numbered (in pencil) 471." A Parry collection that would represent a potential type for *Eupatorium bigelovii* has not been located at GH.

The species represented by the Bigelow collection is the one that has been collected numerous times in northeastern Mexico and immediately adjacent Texas. The collection almost certainly was made along the Texas-Mexico boundary, in the known range of the species, in the region covered by the United States and Mexican Boundary Survey of 1848–1855, for which Bigelow worked as a naturalist. Numerous collections by Bigelow from southwestern Texas are specifically cited in the Survey's "Botany" report. In the tentative interpretation here, a mistake in manuscript preparation apparently led to a substitution both for the correct collector (Parry instead of Bigelow) and correct locality (On the Gila, Sonora, instead of 'along the Texas border'). Gray's choice of epithet supports this interpretation.

Eupatorium madreense S. Watson, Proc. Amer. Acad. Arts 26:137. 1891. TYPE: MEXICO. Nuevo León: Sierra Madre near Monterey, 7 Jun 1888, C.G. Pringle 2201 (HOLOTYPE: GH photocopy!).

ACKNOWLEDGMENTS

We are grateful to Steve Boyd and Michael Denslow (RSA-POM) for information and photocopies of *Eupatorium arborescens*, Phil Jenkins and Michael Chamberland (ARIZ) for checking potential occurrences of *Chromolaena bigelovii* at ARIZ, Phil Jenkins for comments on *Ageratina thyrsoiflora*, Jane Mygatt (UNM) and Rich Spellenberg (NMC) for providing information on New Mexico collections, Barbara Hellenthal for checking the potential occurrence of collections at NDG, Harold Robinson (US) for review comments, and Emily Wood and Walter Kittredge (GH) for providing information and photocopies of various GH collections.

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